

[0029] FIG. 23B is a perspective view of a chair frame pole tip in accordance with one feature of the present invention;

[0030] FIG. 23C is a detailed view of a knurled ferrule interconnecting two chair support members in accordance with yet another feature of the present invention;

[0031] FIGS. 24A and 24B are side and front views of another embodiment of the chair frame ground contacting end cap in accordance with another feature of the present invention;

[0032] FIG. 25 is a close-up cross-sectional view of a chair frame ground contacting end cap in accordance with a feature of the present invention;

[0033] FIGS. 26A and 26B are perspective views of an elastic backrest support in accordance with one feature of the present invention; and

[0034] FIGS. 27A, 27B, 28A, 28B, 29A and 29B are detailed views of a slider buckle in accordance with yet another feature of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0035] The present invention features a swinging chair 10, FIG. 1, having a swinging seat portion 12. In one embodiment, the swinging seat portion 12 is made of a lightweight, pliable material such as woven or knit fabric, mesh, or leather. In another embodiment, the swinging seat portion 12 may be made of a more rigid, non-pliable material such as wood, plastic or composite material.

[0036] The seat portion 12 hangs from a lightweight and strong freestanding frame 14 (FIG. 2 for example) typically made of aluminum tubing having cross sectional widths in the range of 0.25 to 5.0 inches. The frame 14 is termed “rigid” however the frame 14 exhibits the properties of being free standing and able to support the weight of a person in the chair but is in fact also flexible to some extent, as is generally found in materials such as aluminum. The aluminum material may have a shape other than circular such as elliptical or square for example and generally has a wall thickness of approximately 0.05 to 0.5 inches. Other suitable materials such as metals, metal alloys, polymers, polymer composites, wood, ceramics or any combination thereof are contemplated and considered to be within the scope of the present invention.

[0037] The frame 14, FIG. 2, is, in one embodiment, preferably formed by seven (7) segments: a first three (3) segment portion 16 including one set of two legs (16a and 16b) and upright chair support member (16c); and a second three (3) segment portion 18 forming a second set of two legs (18a, 18b) and upright chair support member 18c. In another embodiment, in order to make the frame 14 more portable and packable, the upright chair support members 16c and 18c may each be provided as two interconnecting segments (16c1, 16c2, 18c1 and 18c2, FIG. 2A) to provide more portability and packability for the chair. Each individual segment 16c1/16c2 and 18c1/18c2 may be connected together to the corresponding adjacent segment by an elastic shock cord as is commonly found in tent frames. Each individual upright support member segment 16c1, 16c2, 18c1 and 18c2 may be roughly the same length to provide for easy packing.

[0038] In another embodiment of a less portable and non-packable chair, the frame 14 may not break down but

may be formed of a welded steel or aluminum frame, molded carbon fiber or composite, or the like.

[0039] In one of the embodiments disclosed herein, the first three segments 16 are held together in place by a first “hub” 20, while the second three segments 18 are held together and in place by a second identical “hub” 22. A “crossbar” spacer segment 24 keeps the first and second hubs 20, 22 and accompanying segments 16/18 in a fixed relationship (i.e. a fixed distance) from one another.

[0040] Each “hub” 20/22 (shown in greater detail in FIGS. 5A-5E) are manufactured from metals, metal alloys, polymers, polymer composites, wood, ceramics or any composite material that can be used to fabricate the hubs 20/22, all considered to be within the knowledge of those skilled in the art and within the scope of the present invention.

[0041] The leg segments 16a, 16b and 18a, 18b are arranged by the hubs 20, 22 at an angle 26 in FIG. 3 of between 45 and 90 degrees (preferably 32 degrees) from a vertical axis 30 when viewed from the front or back (as in FIG. 3), while each pair of leg segments 16a/16b and 18a/18b are also arranged at an angle 42 FIG. 4 vis-à-vis one another in the range of 0 to 90 degrees (preferably approximately 54 degrees) from the vertical axis 44 when viewed from the side. The chair support segments 16c and 18c are arranged and maintained at an angle 28 in FIG. 3 of between 0 and 45 degrees from the vertical axis 30 (preferably approximately 20 degrees).

[0042] In one embodiment, spacer segment 24 is arranged essentially level horizontally. In another embodiment, spacer segment 24 may be curved as shown by dashed line 24a in FIG. 3 (see also FIG. 22) so the height of the hub 20 can be increased and the crossbar segment 24 does not interfere with the bottom of the swinging seat 12.

[0043] It is contemplated that the swinging chair in accordance with the teachings of the present invention may be provided in 2 sizes. In the small size, the chair legs 16a/16b and 18a/18b have a length of approximately 11.4 inches while in the larger size, have a length of approximately 15 inches. The frame upright chair supports 16c/18c have a length of approximately 23.6 inches in the small size and 28 inches in the large size. In the small size, the crossbar segment 24 is approximately 18 inches in length while approximately 17 inches in length and the large size.

[0044] Chair components of the sizes (large and small) contemplated by the present invention provide a chair frame having approximately 34 inches of spacing for the small frame and 35.5 inches of spacing for the large frame between the 2 upright most portions of the frame 50 and 52 FIG. 6A; 26 inches between the bottoms of the chair frame feet where they contact the ground from a frontal perspective in the small size, FIG. 6B, and 28 inches between the bottoms of the chair frame feet in the large size.

[0045] The chair frame feet are preferably arranged approximately 19 inches apart at the base of the feet where they contact the ground from a side perspective for the small size, FIG. 6B, and 25 inches for the same components in the large size. The bottom portion of each of the legs 16a-16b and 18a-18b may include a nonslip foot 31 as shown in FIG. 8.

[0046] In one embodiment wherein the chair frame and/or chair is packable or can collapse to make it more portable, the individual segments 16a-c, 18a-c and 24 are removed